JUNE 28 - 30, 2005 NORFOLK CONVENTION CENTER

Navy C2 Program Office

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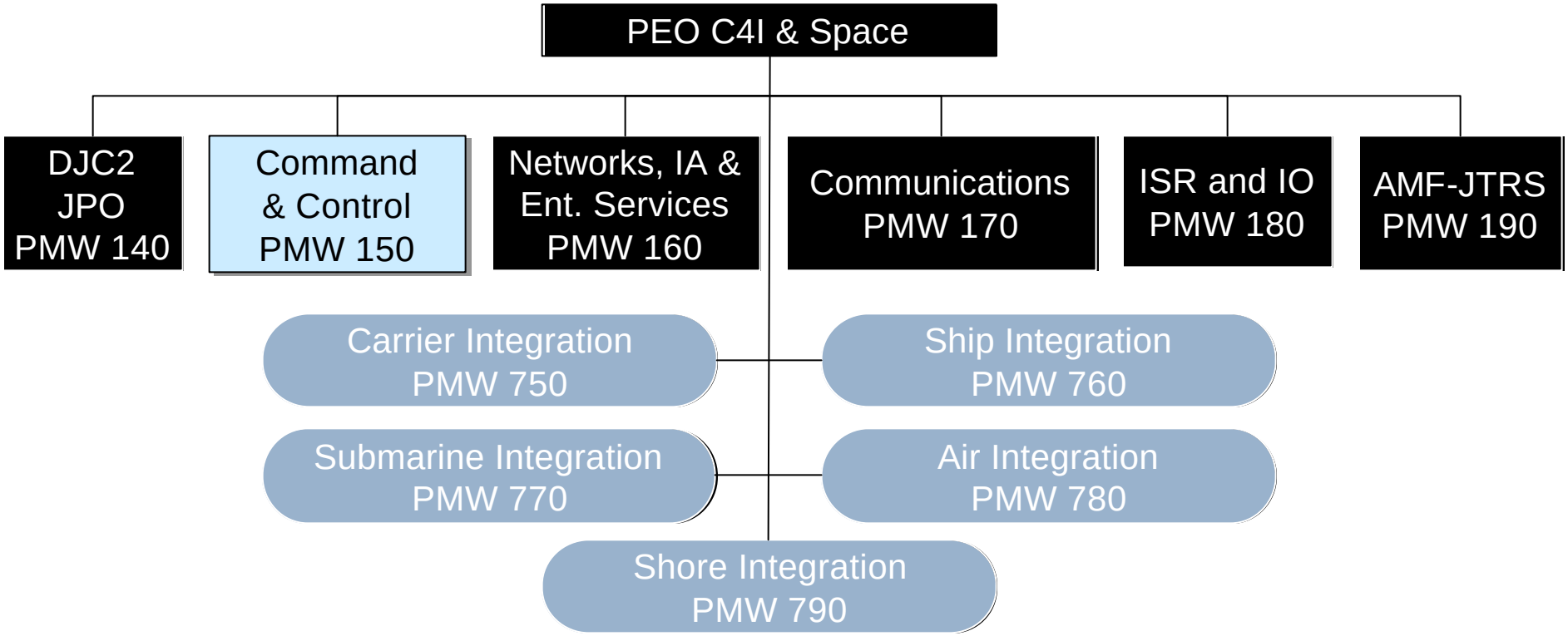
29 June 05

Sponsored by SPAWAR
SPAWARSYSCOM
FORCEnet Chief Engineer

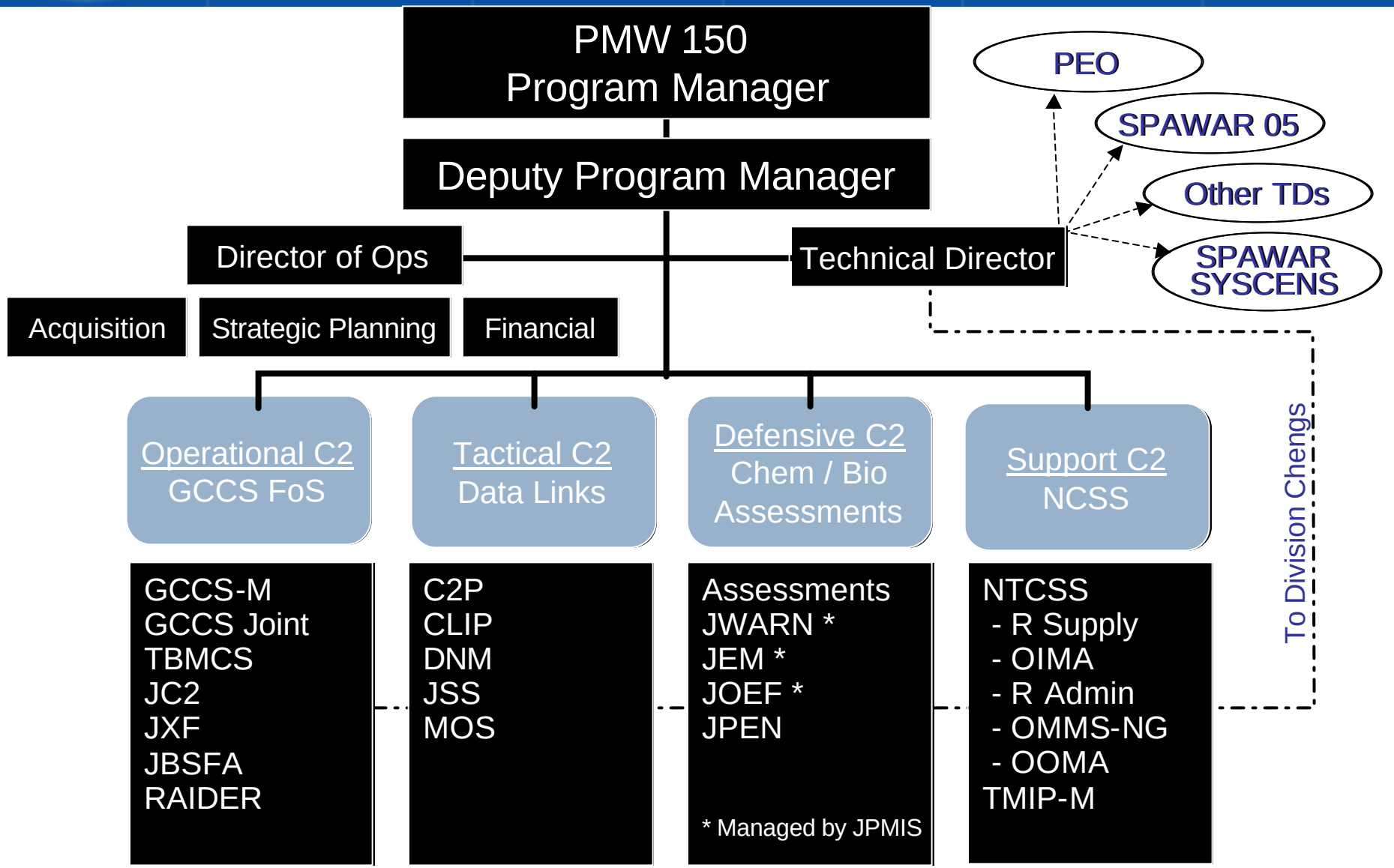
PEO(C4I & Space) Organizational Structure



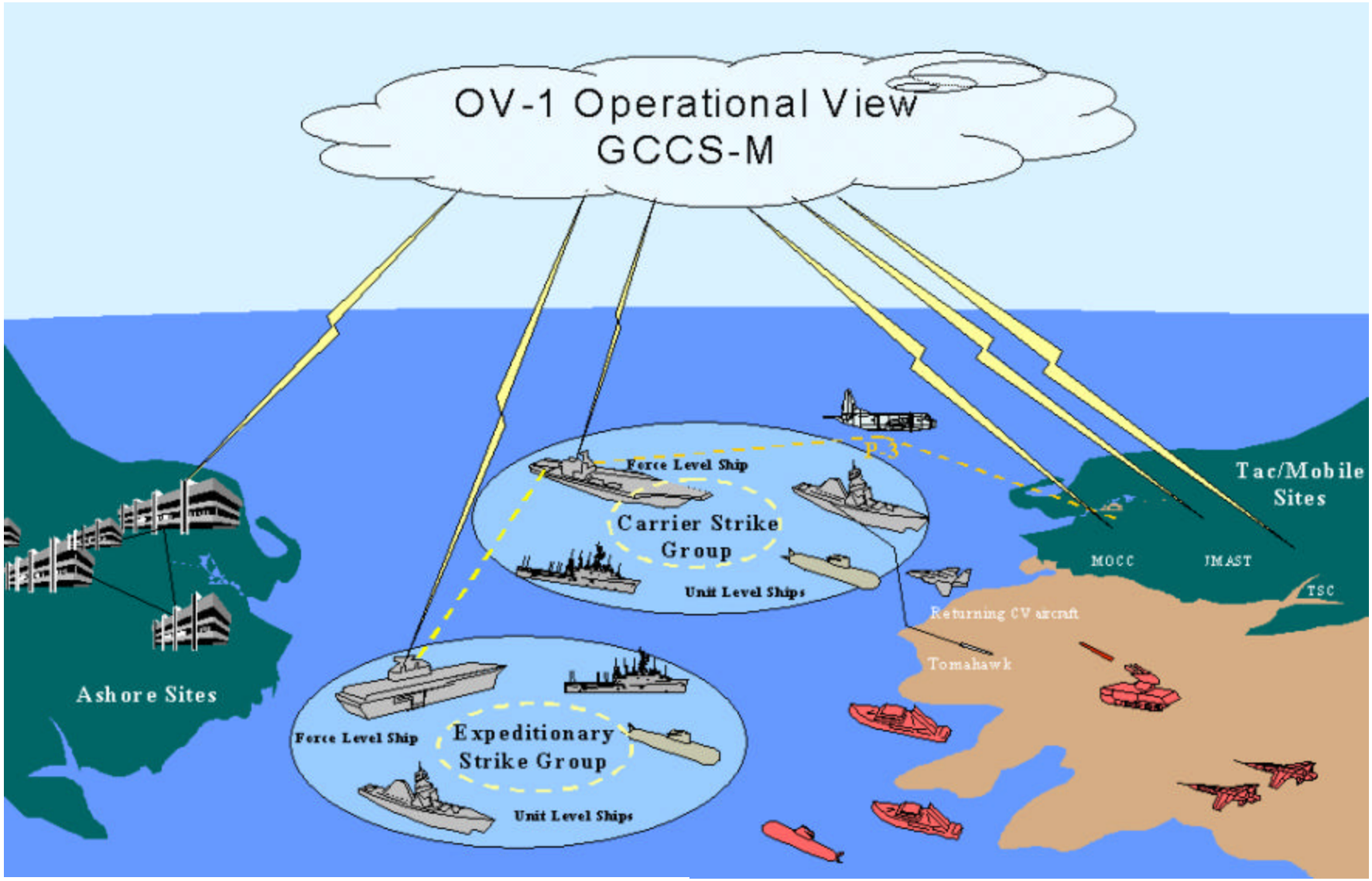
Functional PMs responsible for product development and sustainment.

Platform PMs are responsible for Integration to the platforms, primary fleet POCs, Installation, and accelerated delivery of the C4I capabilities to platforms (through platform sponsors and new ship construction).

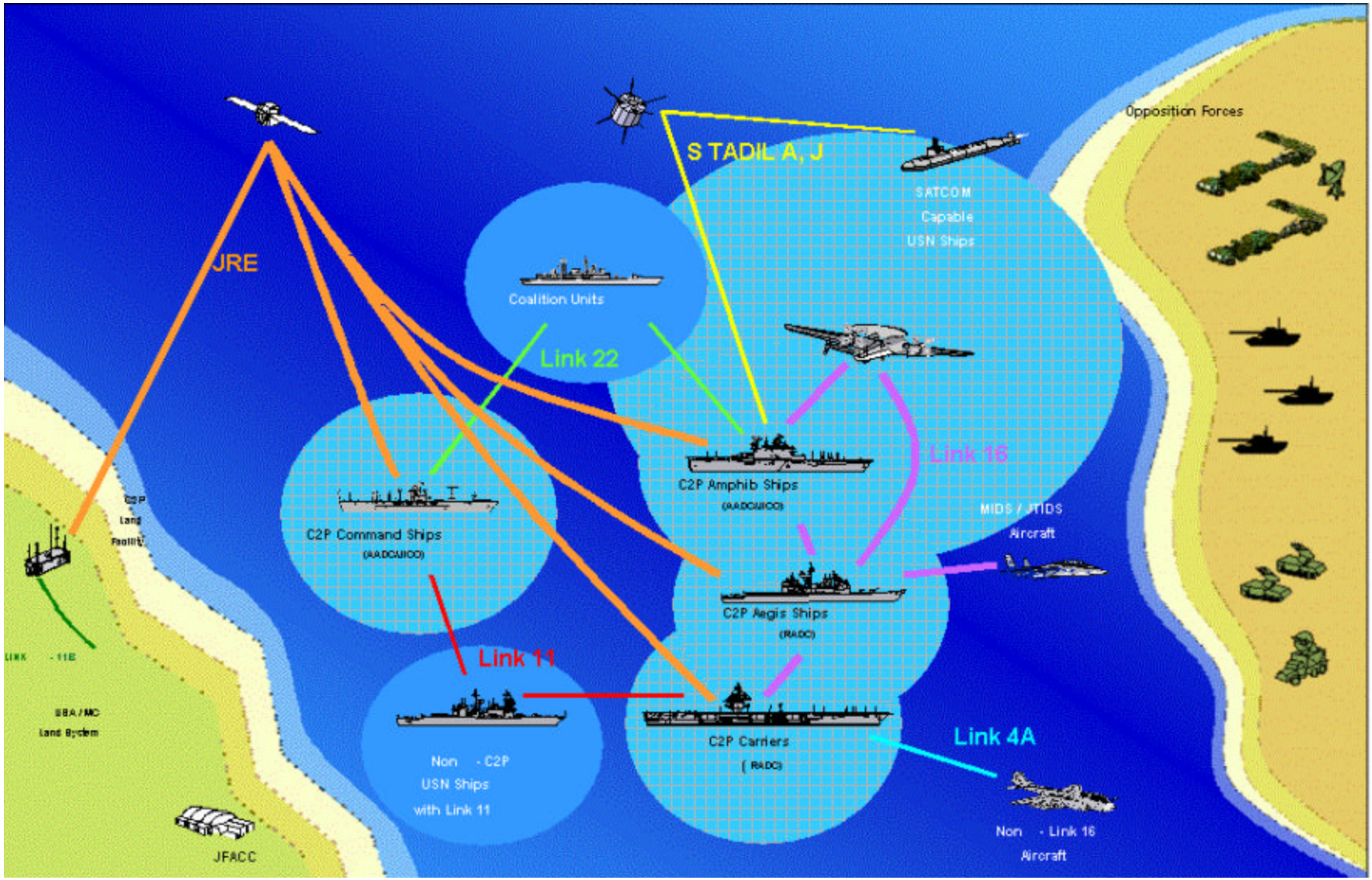
Key Programs & Projects



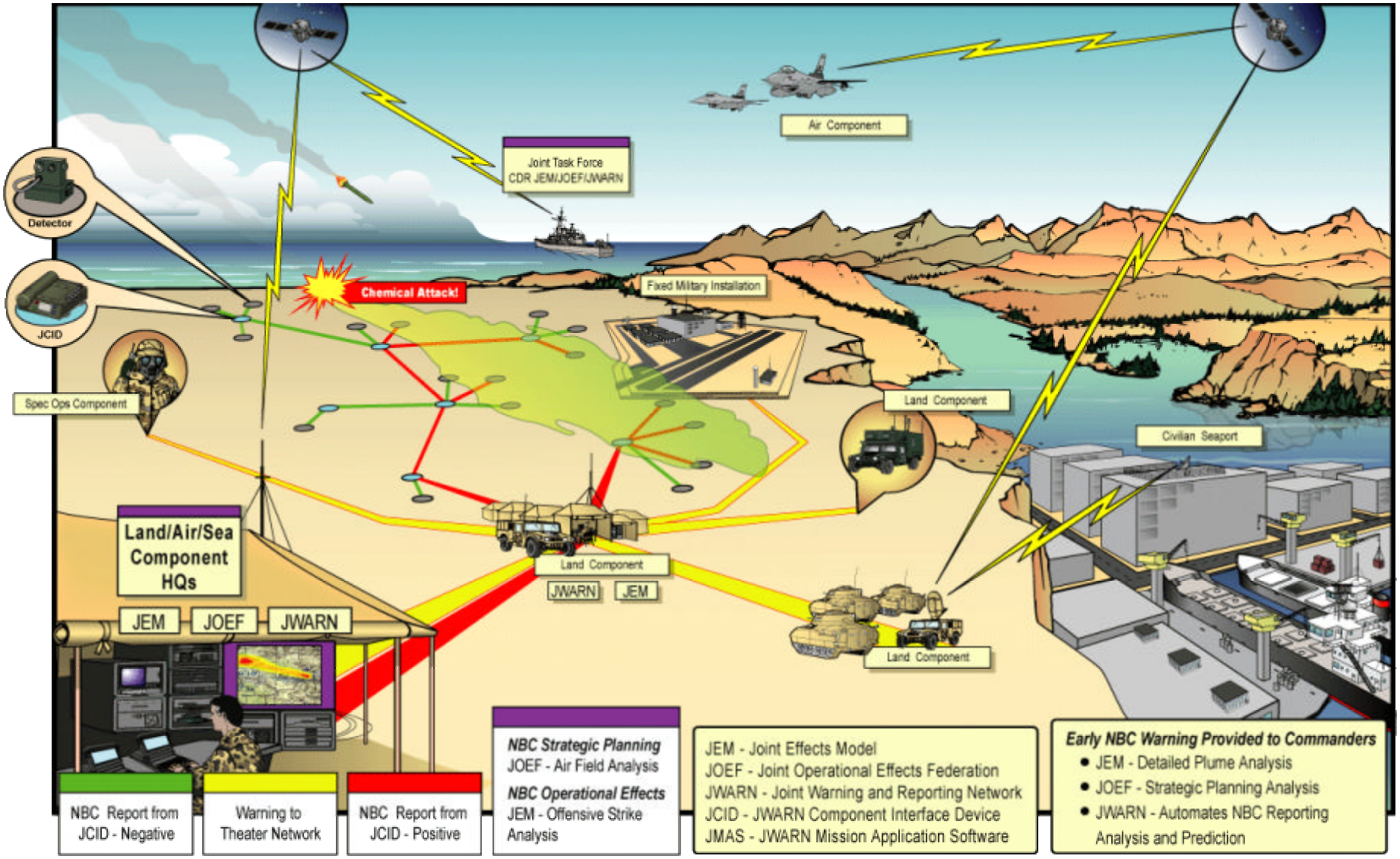
Operational C2



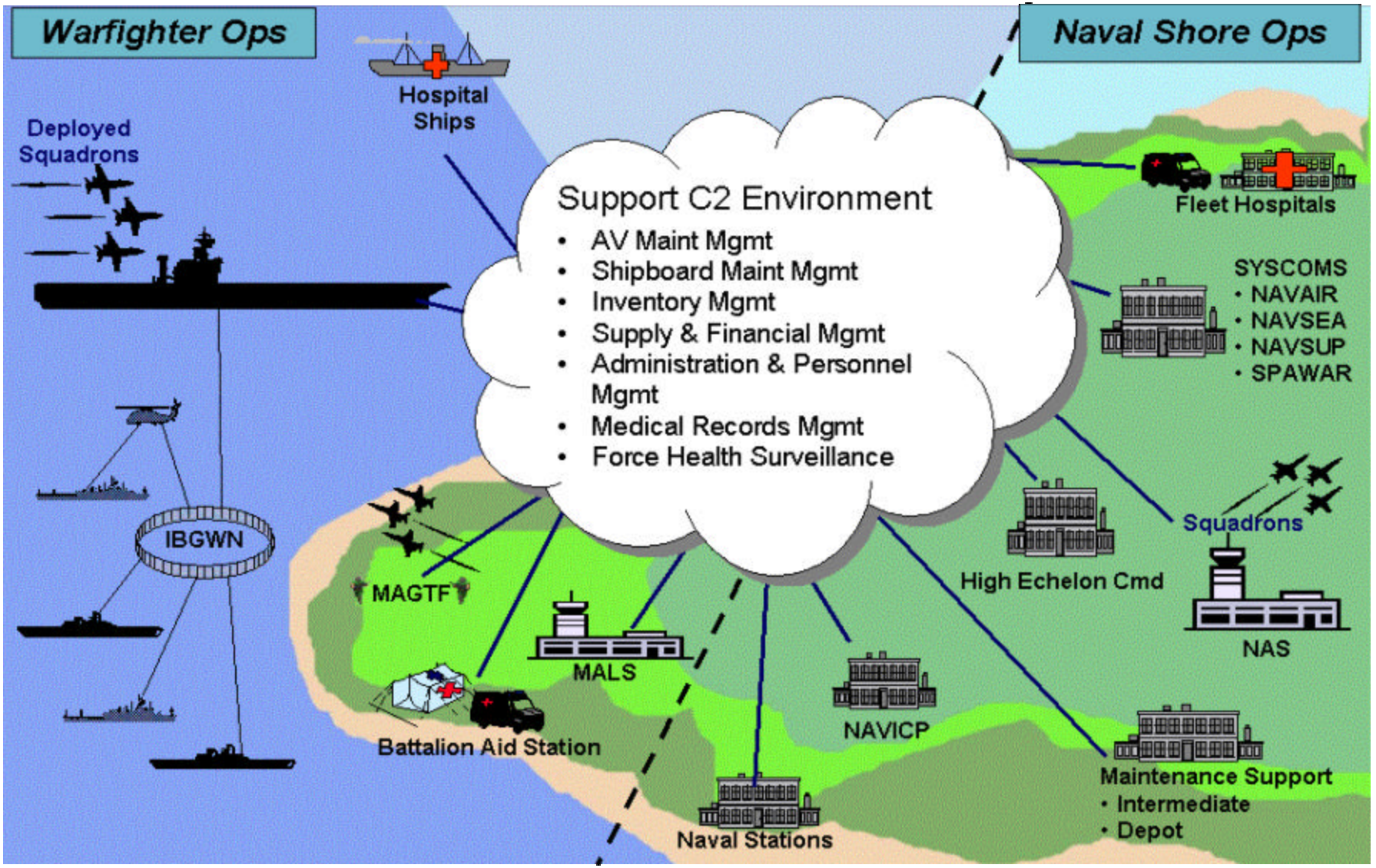
Tactical C2


JRE
S TADIL A, J
Opposition Forces
SATCOM
Capable
USN Ships
Coalition Units
Link 22
Link 16
C2P Amphib Ships
(AADC\JICO)
C2P Command Ships
(AADC\JICO)
MIDS / JTIDS
Aircraft
C2P Aegis Ships
(RADC)
Link 11
C2P Carriers
(RADC)
Link 4A
Non - C2P
USN Ships
with Link 11
Non - Link 16
Aircraft
C2P
Land
Facility
LINK - 11B
BBA / MC
Land System
JFACC

Defensive C2

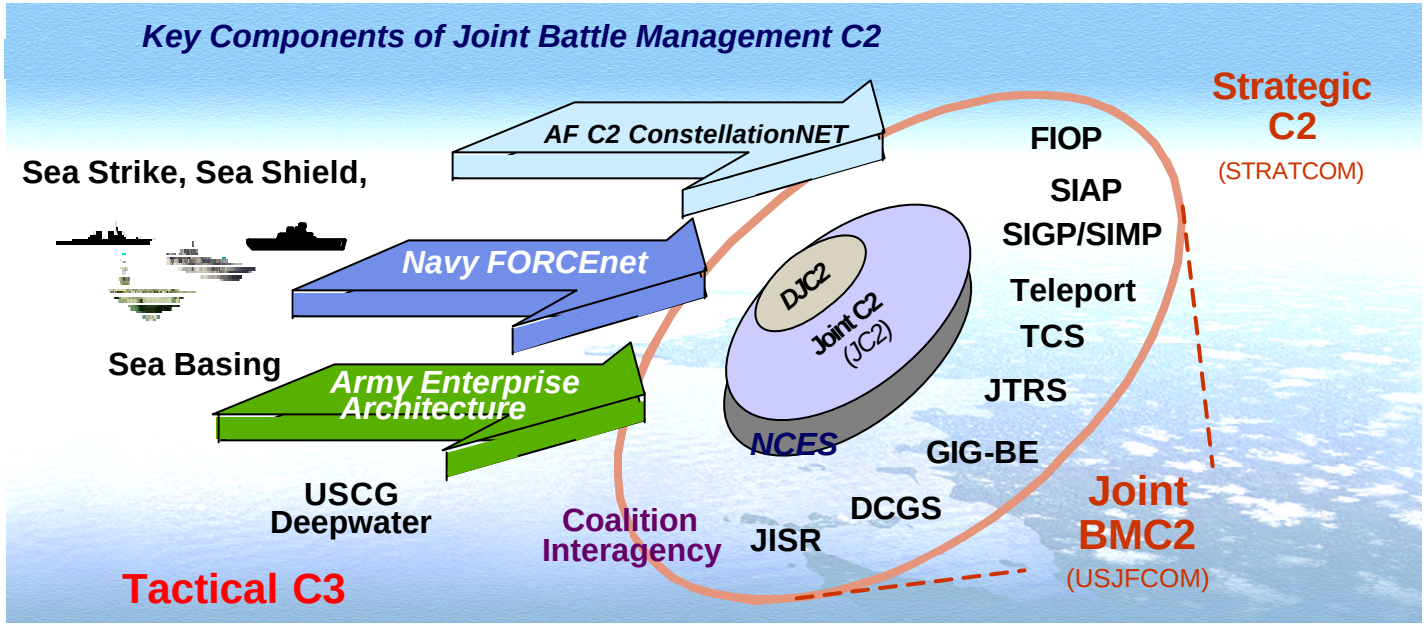


Support C2


Warfighter Ops
Naval Shore Ops
Hospital Ships
Deployed Squadrons
Support C2 Environment
• AV Maint Mgmt
• Shipboard Maint Mgmt
• Inventory Mgmt
• Supply & Financial Mgmt
• Administration & Personnel Mgmt
• Medical Records Mgmt
• Force Health Surveillance
Fleet Hospitals
SYSCOMS
• NAVAIR
• NAVSEA
• NAVSUP
• SPAWAR
IBGWN
MAGTF
MALS
Battalion Aid Station
High Echelon Cmd
Squadrons
NAS
NAVICP
Maintenance Support
• Intermediate
• Depot
Naval Stations

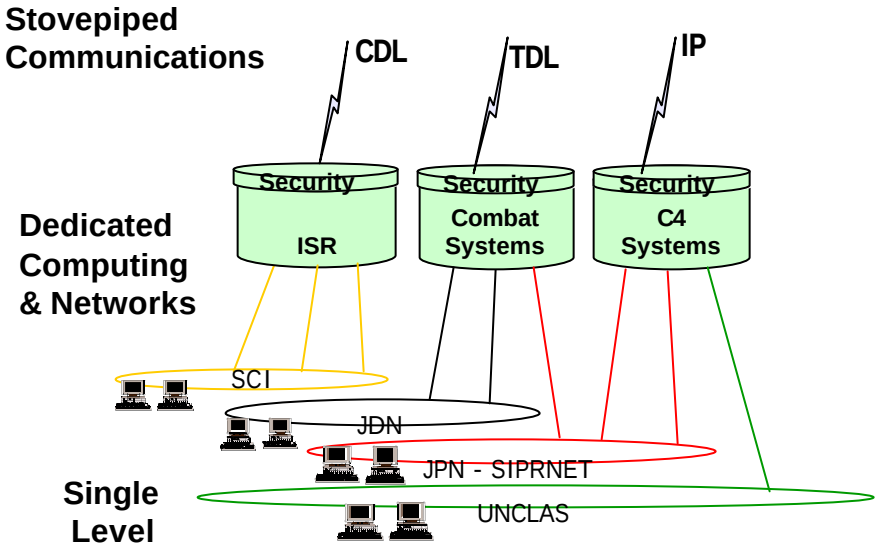
The FORCEnet Concept

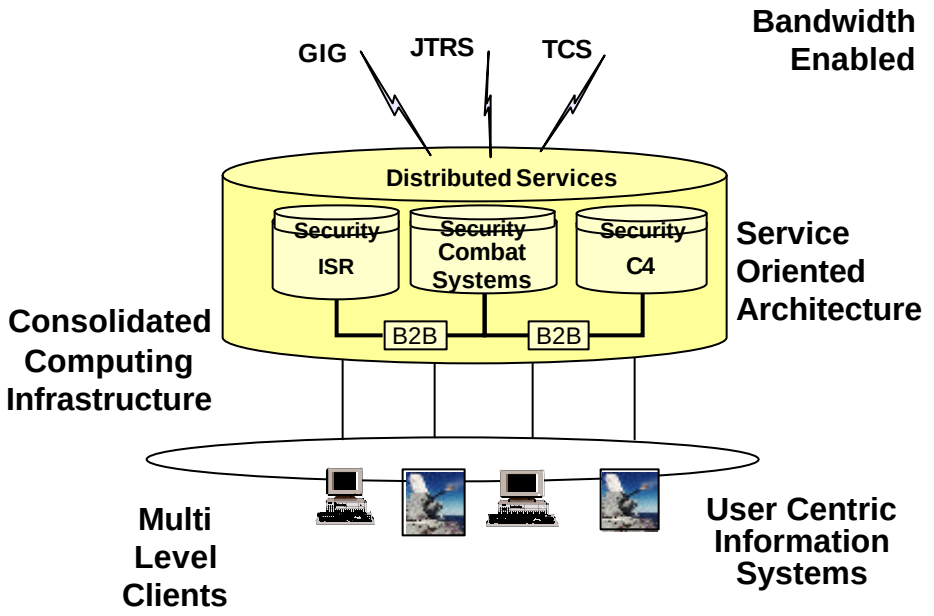
- FORCEnet *is* the Naval component of the Global Information Grid
- FORCEnet *means* the warfighter can:
  - Put the right weapon on the right target at the right time
  - Tailor their information requirements and presentations to support their missions
  - Get sensor coverage when and where they need it
  - Allocate bandwidth and priorities for applications and individuals
  - Collaborate with anyone, anywhere, anytime



"FORCEnet is an inherently Joint/Coalition concept, both relying on and providing essential capabilities to the Joint/Coalition community and other Services and Agencies"

Current C4I Environment to Future Vision





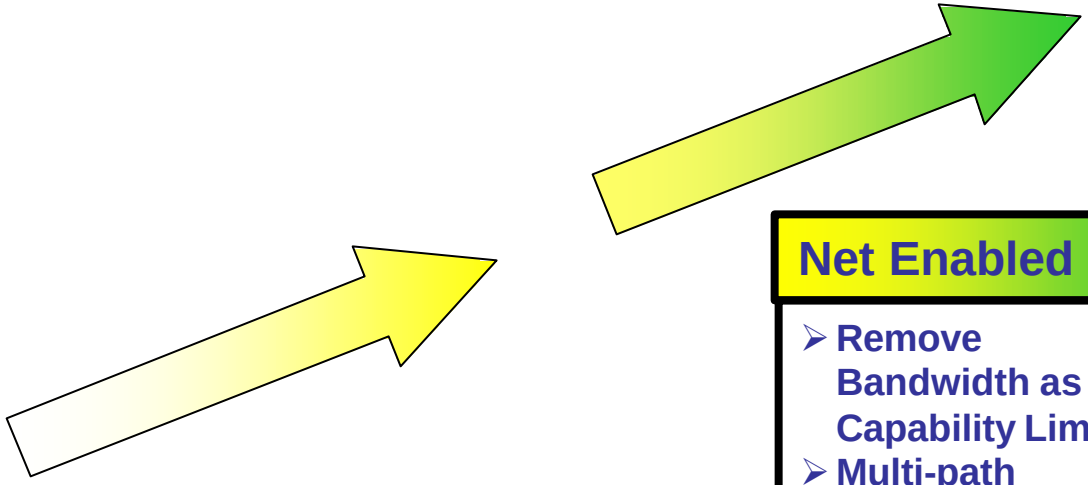
IT21 Today

- Bandwidth Constrained
- Stovepiped Systems
- Multiple Enclave and Application Specific Networks
- Isolated Coalition Enclaves
- Inconsistent Data Quality

Net-Centric Warfare Objectives

- Remove Bandwidth as a Capability Limit
- Multi-path Transport & Redundant Paths
- Capability on Demand
- Distributed Operations
- Multi-User Access
- Assured Sharing

Capability Stepping Stones to Net Readiness



Full IT21 – Online

- IP Reach Back
- Local Area Ntwks
- Wideband Receive
- RF Management
- Survivable comms

Level 0

Today

Net Connected

- Initial Services Oriented Network Architecture
- Ruggedized Networks
- Double Bandwidth
- Improved Coalition Operations

Level 1

FY07

Net Enabled

- Remove Bandwidth as a Capability Limit
- Multi-path Transport
- Improved Bandwidth Mgmt
- Redundant Paths
- Applications Migrating to Network
- Common Enterprise Infrastructure

Level 2

FY10

Fully Net Ready

- Remove Bandwidth as a Capability Limit
- Multi-path Transport
- Dynamic Bandwidth Mgmt
- Multi-National Information Sharing
- One Stop Information Shopping
- Information Provided to Operator is Relevant, Timely, Accurate, and Usable
- Redundant Paths
- Merged Networks

Level 3

FY14

NCW Level Components

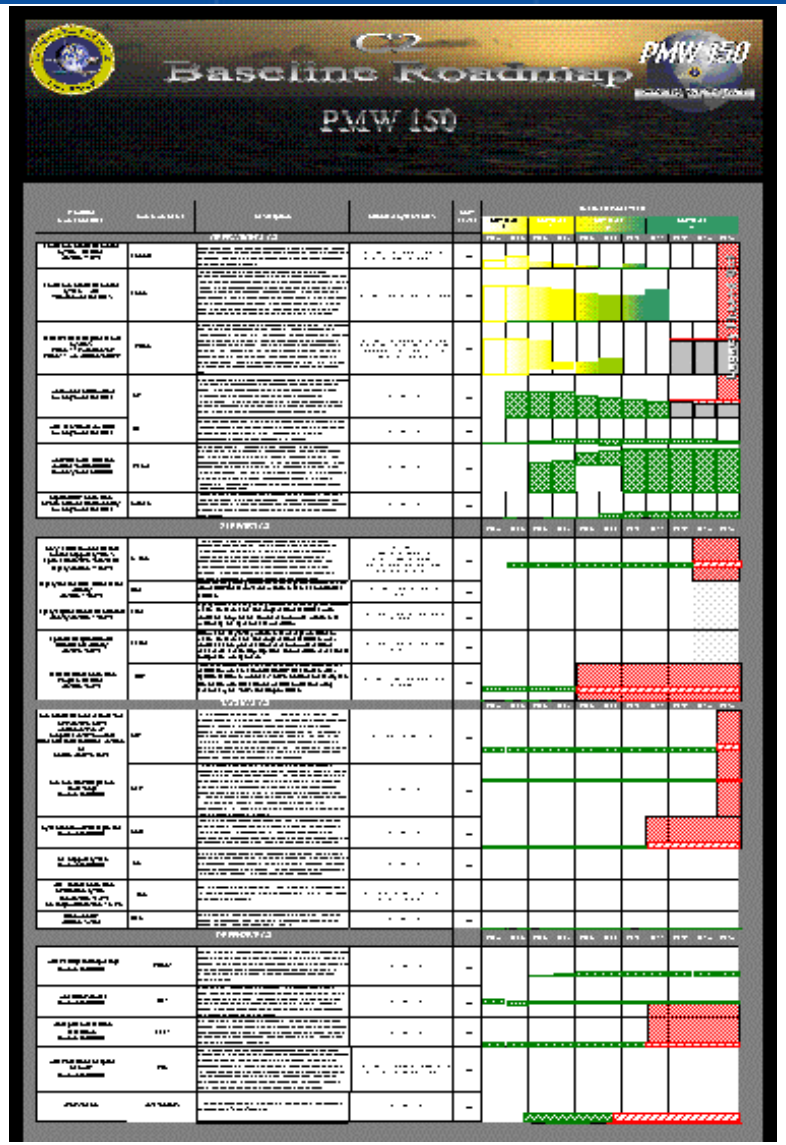
	Platform	Level 0 Basic Network Connection	Level 1 Higher Bandwidth & Improved Network Infrastructure	Level 2 NCW Enabled	Level 3 Fully NCW Ready
Bandwidth Enabled	Ships Subs Shore	IP capable, Link 11, Link 16, MIDS-LVT (LOS Only), DWTS, CWSP, EHF MDR, DSCS, INE	INMARSAT upgrades (2X BW), GBS IP migration, EHF TIP, X/C-Band for DDGs, ADNS Incr 2 (IP Static QoS Mechanism, Traffic Mgmt Mechanism & Application Prioritization, WGS BW Bottleneck), ISNS Incr 1 (Traffic Shaping/IP compression), Link 22, Dynamic Data Link Network Management, CSRR, Sub HDR antenna, High Speed Global Ring (HSGR), SSGN, VA SHF, Sub cutover to IP, BLOS Tactical Data Exchange, VoIP Incr 1, HAIPE	IPv6, NMT (4X Protected BW (2 Mbps)), WGS w/ EBEM modem (10X BW (15 Mbps)), MUOS (64 Kbps to small term), JTRS, WNW, Tactical Networking Waveform, Video over IP, CDL Spiral 1, Sub COMMS at Speed/Depth, Sub SHF (FOT, Sub X-Band Turbocodic modem), WGS Ka, ADNS Incr 3 (Black Core Routing), Satellite Dynamic Bandwidth Allocation, Sub HDR antenna, VoIP Incr 2	TSAT w/ TC terminal (17-45 Mbps protected), Advanced HDR antenna, TCDL/Ku-band in the OE-538, VoIP Incr 3, IXS Cutover/Assured IP
	Aircraft	Legacy, MIDS-LVT (LOS Only), Link 11	Link 16, Link 22	MIDS JTR, WNW (TTNT-Like), Tactical Networking Waveform, Weapons Data Link	TSAT w/ TC terminal (17-45 Mbps protected), IXS Cutover
Services Oriented Architecture	Ships Subs Shore	Sharing of data via translators (Link 16 data to CCS via translators), IP Capable via LAN, Link 11, MIDS-LVT (LOS Only) Link 16 data integrated into Combat (exception of 10 CVs, CGs), Serial Crypto, INE, CENTRIXS, GPS Receivers (NAVSSI)	GCCS 4x (web enabled services). ISNS Incr 1 (ruggedized redundant network, GIG-E), SSEE incr E, NGC2P, Link 22, COMPOSE 2&3, Sub-LAN (Incr 1&2), CDL-N, SCI Networks incr 2, Enterprise Management Spiral 1, CENTRIXS BLK 2, CND Phase 3, EKMS Phase V, BLOS Tactical Data Exchange, Port DMS to ISNS/Sub LAN, GPS User Equipment Upgrade (NAVSSI, NAVWAR), HAIPE	IPv6, NCES Incr 2 (Common Enterprise Infrastructure, Open Services/Interfaces, Web-Enabled), DCGS/TCS, WNW uses CLIP for Combat interface, COMPOSE 4, CDL Spiral 1, CLIP, JTRS, WNW, Tactical Networking Waveform, SSEE incr F, JICO Support System , Enterprise Management Spiral 2, Content Based Encryption, GPS Modernized User Equipment, ISNS Incr 2	CDS (Content Based INFOSEC), Merged Networks, NCES (Incr 3), IP based combat systems (DDX, CVN 21), Assured IP, Sub-LAN Incr 3, Enterprise Management Spiral 3, SCI Networks incr 3
	Aircraft	Some aircraft with Link 16 MIDS-LVT (LOS Only), Link 11, GPS Receivers	Link 16, Link 16 data integrated into OFP, Link 22, GPS User Equipment Upgrade (NAVWAR)	CLIP, MIDS JTR, WNW (ANW), Tactical Networking Waveform, Stand Alone Display uses IP data (Kneeboard IP capability via WNW pipe), WNW uses CLIP for host interface to OFP, Weapons Data Link, GPS Modernized User Equipment	CDS (Content Based INFOSEC), OFP uses IP based information, Modify OFP to handle IP based traffic
User Centric Information Systems	Ships Subs Shore	Sharing of data via translators, CDF/BGPHES/COBLU	GCCS 4x/JC2 Incr 1 (Web Enabled Devices, User Defined Operational Picture (UDOP)), COMPOSE 2&3, SSEE incr E, CUB (SCI GCCS), METOC Upgrades, NTCSS, Optimized Organizational Maintenance Activity (OOMA), TMIP-M, Navy Enterprise ERP Convergence Effort, CBR Dispersion, JWARN,	IPv6, JC2 Incr 2 (Common Enterprise Infrastructure, Applications Migrate to NCES), CLIP, COMPOSE 4, DCGS/TCS, SSEE incr F, JICO Support System	JC2 Incr 3 (DOD wide use of Services Oriented Architecture), CDS (Content Based INFOSEC)
	Aircraft				JC2 Incr 3 (Modified OFP to handle IP based Information)

NCW Level 1

NCW Characteristic	Net Connected Objectives/ Attributes	GCCS-M Global Command and Control System - Maritime	DNM Dynamic Network Management	NGC2P Joint Range Extension Link 22	JSS JICO Support System
Bandwidth Enabled	▪ Increase Bandwidth ▪ Multi-path Transport ▪ Dynamic Bandwidth Management ▪ IP Convergence	▪ Transitions from legacy COMMS to IP-based COMMS (OTCIXS to Netprec CST and DMS)	▪ Time Slot reallocation ▪ Provides efficient use of capacity	▪ Reduces need for airborne relay ▪ Provides redundant paths ▪ Enhanced throughput	▪ Provides multi-path networking ▪ Increases bandwidth through efficiency
Services Oriented Architecture	▪ Composeable Services ▪ Web based services ▪ Shared Data ▪ Improved Coalition Info Sharing ▪ One stop shopping	▪ Provides enhanced composeable services (DAL, GRS/CFn) ▪ Provides web-based services (Intelshop, ITS Web, WebCOP) ▪ Allows tailorable data exchange (Intel Shared Data Server and ORDS)	▪ Simplifies network initiation ▪ On demand allocation of time slots ▪ Allows on the fly net access	▪ Improves Coalition sharing through Link 22 ▪ Provides BLOS with JRE	▪ Plans, Monitors and Manages the Multi-TDL network
User Centric Information Solutions	▪ Work flow driven Apps ▪ Standardized data ▪ exchange between domains ▪ Relevant, timely and accurate information ▪ Reduced space, weight, power ▪ Cross domain data	▪ Provides relevant, timely, and accurate information via COP Sync Tools, MIDB Replication ▪ Reduces Decision Cycle Time via tailorable situational awareness tools (Analyst Workshop, WSM)	▪ Simplifies platform ingress and egress		▪ Allows for easier entry and exit of the net.

PMW 150 Capability Roadmap

- Align w/ FORCEnet, NCES, and NCW Readiness Levels 0, 1, 2, 3
- Support our POM 08 efforts
- Consolidate internal programmatic and technical roadmaps
- Develop standard, high-level roadmap to present way-ahead
- Incorporate strategic planning and process
- Identify gaps and overlaps



Architecture and Standards Levels of Guidance

Netcentric Enterprise Solutions for Interoperability (NESI)

Open Architecture (OA)

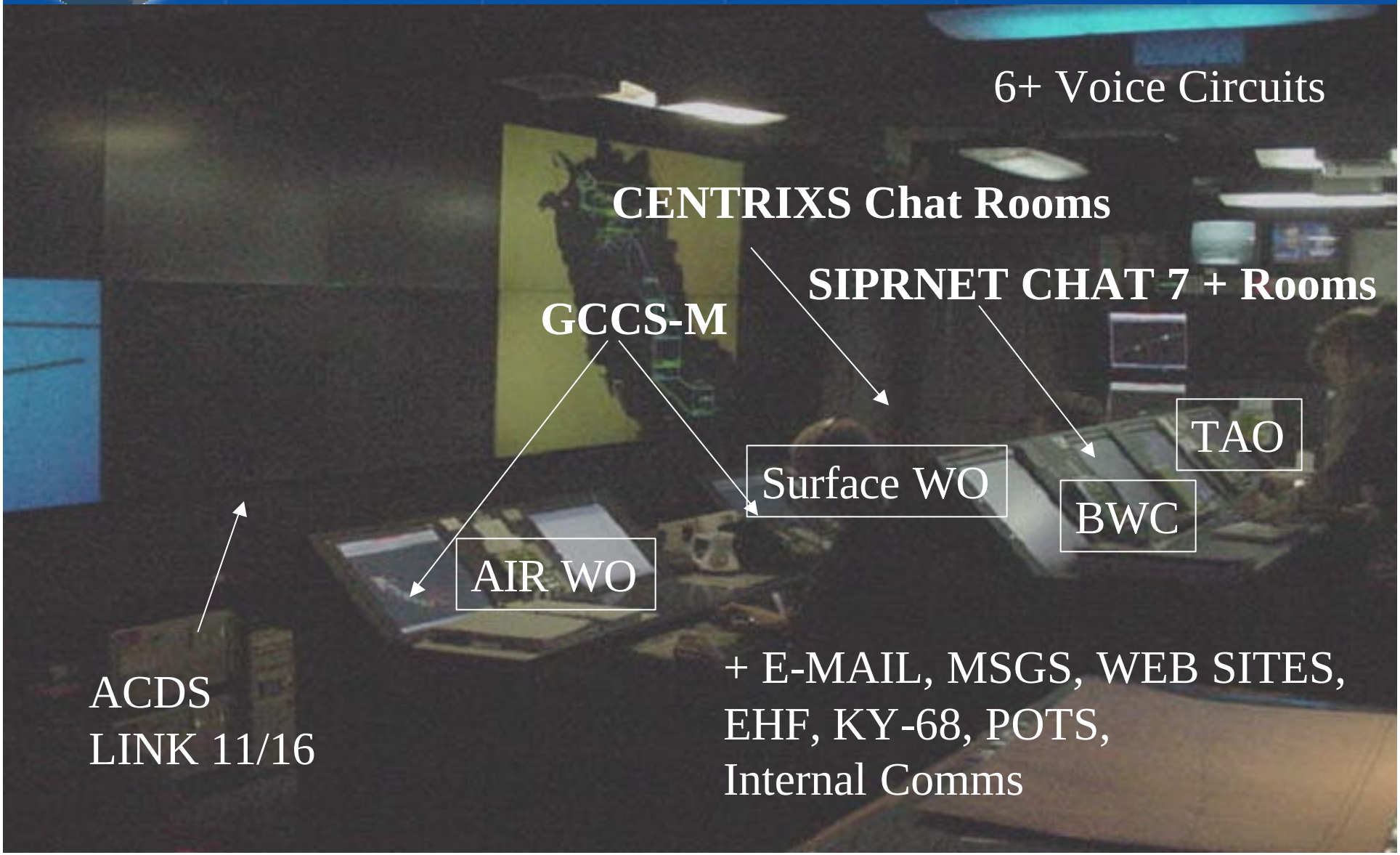
FORCEnet Architecture & Standard Volumes I & II

National Security Space Office (NSSO)

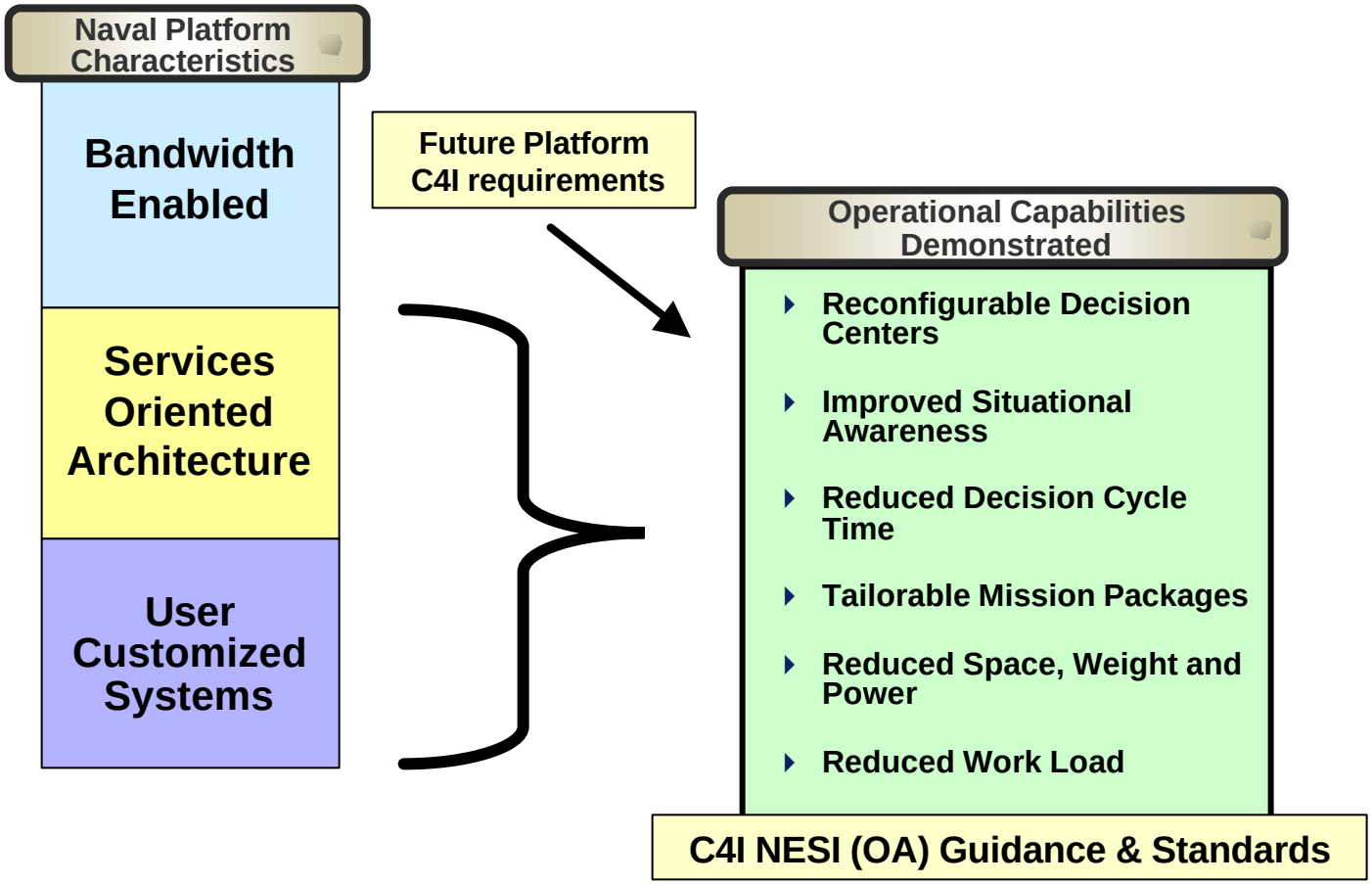
N6 / N7 Guidance

FORCEnet Services Infrastructure (FSI) Phase 0 DEMO

CV TFCC Today



NCW Demonstration Objectives



Re-Configurable Decision Centers

- Today: CENTRIXS is being used to meet OIF coalition interoperability requirements. PEO C4I and Space had to field a separate coalition infrastructure (PCs, servers, software, network)
  - Also required an additional desktop to be added to key work centers
- Objective is to dynamically reconfigure existing C4I infrastructure to meet ever changing CONOPs and warfare requirements
  - Requires systems to be more flexible, open, and dynamic
- Enabling technologies include multi-level workstations, multi-level services, and virtual machine technologies.

Change system function vice bulkheads….

Tailorable Mission Packages

- Today: ASW warfare mission currently requires systems from multiple SYSCOM. I.e (GCCS, METOC, CV TSC, and SSDS)
  - Currently no method for systems to process common information across multiple mission tailored visualizations.
  - Introduction of a new systems requires lengthy integration and certification efforts for all systems.
- Objective is to customize systems and services to meet mission specific requirements
  - “Plug in and fight” with both existing and new services (sensors, correlation tools, etc) in an open and non-proprietary manner.
  - Flexibility to dynamically discover, add and remove services as mission requires
- Emerging service oriented architecture technologies include COTS based, Composeable FORCEnet (CFn) and eXtensible Tactical C4I Framework (XTCF)

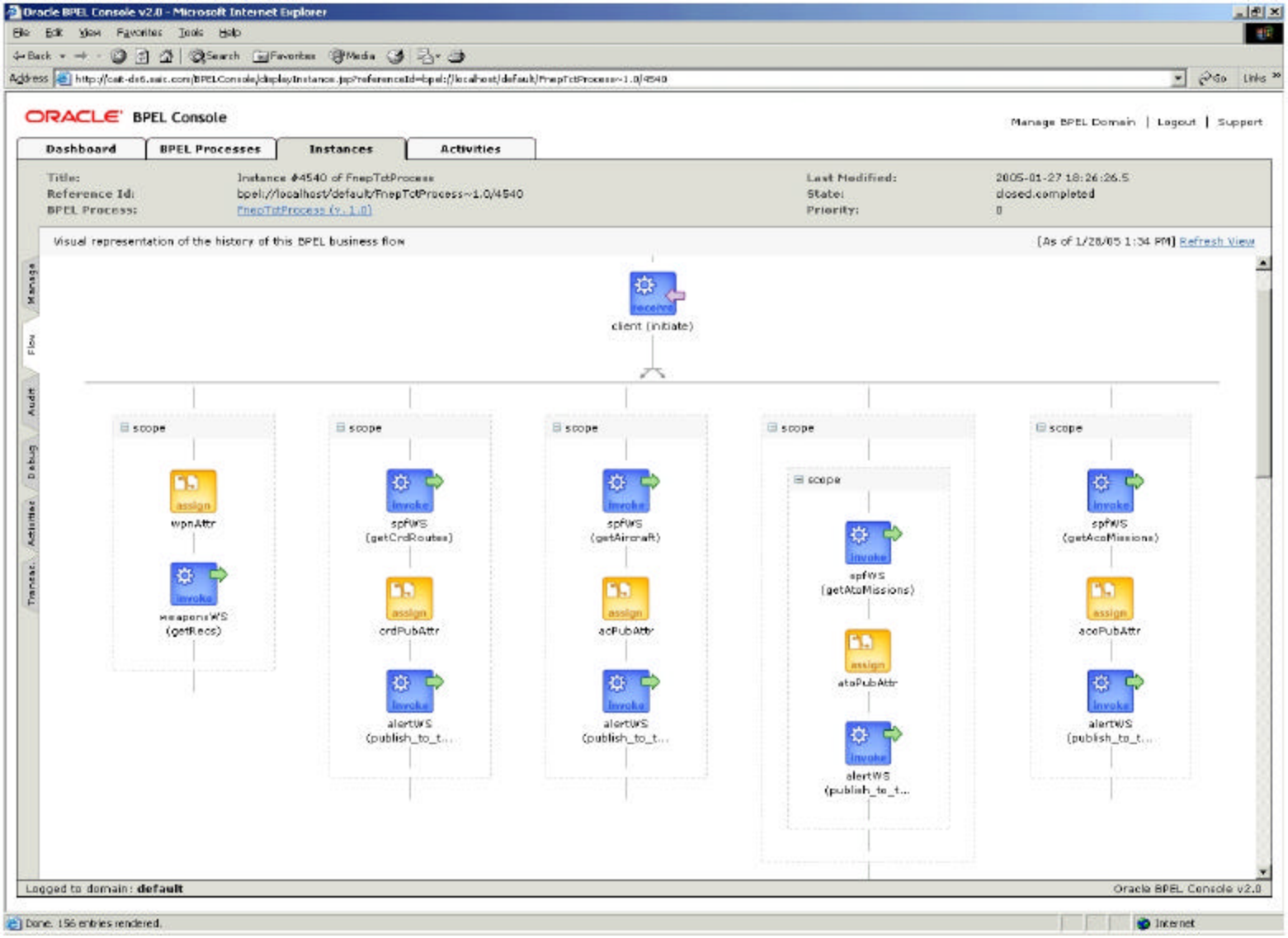
Mission composeable services, not stove piped systems

Reduced Decision Cycle Time

- Today: Time Critical Targeting requires input from multiple different systems (GCCS, TBMCS, JFN, etc) and multiple different process owners (Intel, ROE, targeting, etc.)
  - Currently no way to enforce standardized approach or quickly modify underlying services to meet mission requirements
- Objective is to automate and optimize manual decision processes that rely on information resident on stove-piped systems.
  - Requires systems to be flexible enough to connect and adapt to Fleet work flow
- Use of Open Standards (e.g. Business Process Execution Language - BPEL) allow applications to be dynamically re-configured to adjust to changing ROE/SOPs
  - Event driven processing
  - Optimized use of distributed assets
  - NESI provides foundation for seamless application/service integration

Reduce workload and decision time by optimizing assets

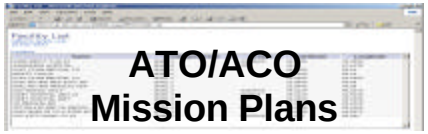
Business Process Execution Language, Process Visualization



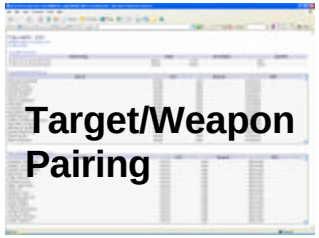
Time Critical Targeting

Orchestration

From SPF



From JMEMS/WASP/JAWS



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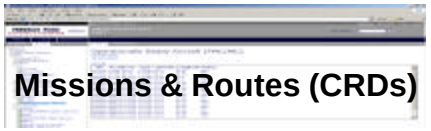
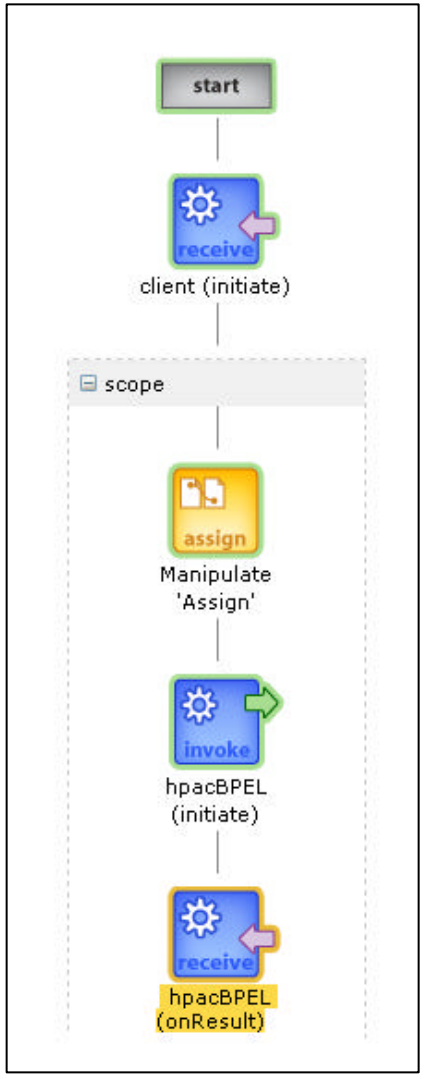
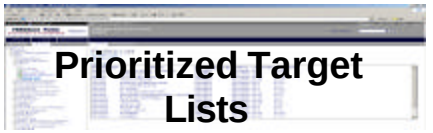




From JIPTL and JTL



To ABM

From WebCOP

FSI…Bring it all Together

- Composeable FORCEnet – Demonstrates power geospatial collaboration and flexibility of multiple visualization tools
- Multi-Level Thin Client – Provides simultaneous access to multiple security enclaves
- Net Centric Distributive Services – Automated and Standardized Business Processes
- eXtensible Tactical C4I Framework – Common information management framework for discovery and C2 object management
- FORCEnet Portal – Based on OSD's Horizontal Fusion capabilities and includes Federated Search, Basic Language Translation Services, and DISA's NCES to include Security Services
- ASOCC and Command Response – Promotes shared awareness between the Navy, HLS, and local and state government systems facilitating rapid GWOT and AT/FP responses.
- NTCSS – Integrating Logistics information into the C2 decision environment
- Distance Support – Linking the warfighter to SMEs for improved operational availability of critical systems

- **Reconfigurable Decision Centers**
- **Improved Situational Awareness**
- **Reduced Decision Cycle Time**
- **Tailorable Mission Packages**
- **Reduced Space, Weight and Power**
- **Reduced Work Load**

Information provided to operator is timely, accurate and actionable

PMW150 Points of Contact

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BACKUPS

Key Milestones in Fiscal Year 2005

- Common Link Integration Processing (CLIP) Increment-1 Milestone B
  - Entry into system development
- Global Command and Control System-Maritime (GCCS-M) v4.0 Full Rate Production
- Global Command and Control System-Maritime (GCCS-M) v4.1 Milestone B
  - A bridge to Joint Command and Control (JC2)
- Optimized Organizational Maintenance Activity (OOMA) Developmental Testing
- Theater Battle Management Core System (TBMCS) Increment 1.1.3 Fielding
- Air Defense Systems Integrator (ADSI) fielding on large deck ships
- Composeable FORCEnet capability expanded fielding in 7th Fleet

FCCC

- FORCEnet Consolidated Compliance Checklist
  - Developed with ASN RDA, OSD NII, OPNAV, NETWARCOM, DON CIO
  - Represents listing of items against which FORCEnet will be measured
  - Contained in FIBL Toolset
  - Referenced in FORCEnet documentation